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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of

Amendment of Part 2 of the
Commission's Rules to Allocate the
455-456 MHz and 459-460 MHz bands
to the Mobile-Satellite Service

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ET Docket No. 97-214

To: The Commission

REPLY COMMENTS

FINAL ANALYSIS COMMUNICATION SERVICES, INC.

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Dated: December 22, 1997

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TABLE OF CONTENTS

SUMMARY	i
I. INTRODUCTION	1
II. DISCUSSION	4
A. Current Spectrum Allocated to Little LEOs Will Only Partially Meet the Global Market Demand for Little LEO Services.	4
B. Little LEO Operations the 455-456 MHz Band Do Not Pose a Threat of Interference to Remote Broadcast Operations.	7
C. Little LEO Operations in the 459-460 MHz Band Will Not Interfere with Land Mobile, Air-to-Ground Radiotelephone or Petroleum Communication Mobile Services.	12
III. CONCLUSION	17

SUMMARY

Final Analysis Communication Services, Inc. ("Final Analysis"), by its attorneys, hereby submits these reply comments on the Commission's *Notice* proposing to allocate domestically to Little LEOs the two megahertz of spectrum in the 455-456 MHz and 459-460 MHz bands to Little LEOs in Region 2 at WRC-95. Consistent with the U.S. position and global determination at WRC-95, domestic allocation of this spectrum to Little LEOs will provide essential spectrum for feeder and service uplink communications. The allocation of this additional spectrum to Little LEOs is in the public interest because it will allow the licensing of additional Little LEO system operators, thereby promoting the Commission's "open skies" satellite policy and competitive deployment of commercial Little LEO satellite services.

The demand for Little LEO-based mobile data and messaging services is enormous and the market for Little LEO services is both emerging and global in nature. Projected market demand for Little LEO services has increased since WRC-95. Thus, allocation of additional spectrum to Little LEOs as proposed in the *Notice* is in the public interest as it will allow Little LEO operators to meet this global and growing demand. Furthermore, understated estimates of global demand for Little LEO services espoused by commenters from the private land mobile and air-to-ground radiotelephony services fail to take into account existing interest among land mobile users for emerging Little LEO-based communications alternatives and are improperly limited to only one segment, such as automated meter reading ("AMR"), of a multi-service Little LEO market.

Broadcast auxiliary licensees have failed to raise any new or cognizable interference concerns in their comments with respect to allocation of the 455-456 MHz band to Little LEOs. As stated in Final Analysis's comments and identified in the *Notice*, Little LEO

operating parameters such as low power techniques and brief message duration limit the potential for interference to broadcast auxiliary operations. In addition, channel polling techniques such as Dynamic Channel Activity Assignment System ("DCAAS") and Final Analysis's DCAAS-based Scanning Telemetry Activity Receive ("STARS") system will prevent assignment of a Little LEO uplink channel if occupied by a broadcast auxiliary transmission. Finally, the broadcast auxiliary commenters' doubts regarding the ability of DCAAS and STARS polling techniques to prevent interference are based on misperceptions of how these satellite-based channel assignment techniques work in reality.

Little LEO uplink transmissions in the 459-460 MHz band will not interfere with land mobile communications in this band. Various sharing studies as well as satellite-based observation confirm that the 459-460 MHz band has suitable spectrum sharing capacity for Little LEO co-channel operations and that DCAAS-type channel assignment techniques will be sufficient to prevent interference with terrestrial co-channel mobile communications. DCAAS techniques will automatically prevent interference to private land mobile uses in the 459-460 MHz band, such as air-to-ground radiotelephony and oil spill containment communications, by avoiding assignment of a Little LEO uplink communication to an occupied channel.

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To: The Commission

REPLY COMMENTS OF FINAL ANALYSIS COMMUNICATION SERVICES, INC.

Final Analysis Communication Services, Inc. ("Final Analysis"), by its attorneys and pursuant to Sections 1.415 and 1.419 of the Commission's rules, 47 C.F.R. §§ 1.415, 1.419, hereby submits these reply comments on the above-captioned proceeding.¹ For the reasons discussed below, Final Analysis urges the Commission to adopt its proposal to allocate domestically approximately 2 MHz of spectrum in the 455-456 and 459-460 MHz bands for non-geostationary mobile satellite service ("NVNG MSS" or "Little LEO") uplink operations. Final Analysis submits that the record in this proceeding wholly supports that conclusion.

I. INTRODUCTION

There is an enormous market demand for global, Little LEO-based data communications ranging from intermittent store-and-forward messaging and data acquisition services to advanced near real-time and interactive applications. The Commission concluded the

¹ *See Amendment of Part 2 of the Commission's Rules to Allocate the 455-456 MHz and 459-460 MHz bands to the Mobile-Satellite Service*, Notice of Proposed Rulemaking, ET Docket No. 97-214, FCC 97-363 (released on October 14, 1997) ("*Notice*"). The reply comment date -- initially December 15, 1997 -- was extended by Order of the Commission to December 22, 1997. *See* Order, ET Docket No. 97-214, DA 97-2608 released on December 12, 1997.

first Little LEO licensing round in 1994. The Commission is close to finishing the second processing round in which the Commission has proposed to facilitate competitive delivery of Little LEO services to meet global consumer demand through the licensing of two new near-real time Little LEO system operators, including Final Analysis,² as well as a store-and-forward-type spread spectrum system.³ The *Second Round Report and Order* concluded that the issuance of licenses to three new systems in the second licensing round will promote competition in global satellite services markets, consistent with the Commission's long-standing "Open Skies" policy, by facilitating the entry of new service providers to compete with incumbent near-real time Little LEO services offered by Orbital Communications Corporation ("ORBCOMM"). *See id.* at ¶ 11.

Little LEO services have a significant need for additional spectrum to realize their full competitive potential, and the 2 MHz of spectrum in the 455-456 MHz and 459-460 MHz bands allocated at WRC-95 in Region 2 is critical for Little LEO feeder and service uplinks.

² Final Analysis has a second-round application pending before the FCC for authority to launch and operate its proposed "FAISAT" Little LEO constellation. Final Analysis is ready to enter the market immediately upon licensing. Among other things, Final Analysis has: invested over \$30 million in the development of its system; built and launched two experimental satellites; begun construction of the first two commercial satellites (the Commission has granted Final Analysis a Section 319(d) waiver to construct the first two commercial satellites in its constellation, and Final Analysis is the only second round Little LEO applicant to receive a Section 319(d) waiver); developed its prototype user terminals; built three commercial quality ground stations; secured launch services for the entire constellation; and signed agreements with its Value Added Resellers and National Service Providers. Final Analysis also has in place utility application demonstration contracts and has implemented an International Awareness Program.

³ *See Amendment of Part 25 of the Commission's Rules to Establish Rules and Policies Pertaining to the Second Processing Round of the Non-Voice, Non-Geostationary Mobile Satellite Service*, Report and Order, IB Docket No. 96-220 (rel. Oct. 15, 1997) ("*Second Round Report and Order*").

By recommending additional spectrum allocations for Little LEO uplinks going into WRC-95, the U.S. and the Commission acknowledged the clear public interest benefit of additional spectrum allocations for Little LEOs.⁴ The allocation of additional spectrum to Little LEOs at WRC-95 confirmed the public interest benefits to be realized in promoting Little LEO service. The decision at WRC-97 to allocate an additional 1 MHz of spectrum to Little LEOs in the bands between 454-460 MHz on a regional basis further confirms the global and U.S. recognition of the need for more spectrum for this service.

In contrast, commenters in the incumbent terrestrial fixed and mobile services in the 455-456 and 459-460 MHz bands have failed to make any showing to disprove that adoption of the proposal in the *Notice* to allocate the entirety of these bands on a co-primary basis to Little LEO services will promote the public interest. The concerns of these parties regarding the feasibility of sharing in the subject bands were fully considered and addressed prior the U.S. decision to request allocation of the subject bands to Little LEOs globally at WRC-95. The *Notice* takes an important procedural step necessary for the implementation of the decision reached at WRC-95. Those commenters who oppose the allocation proposed in the *Notice* effectively seek to revisit and overturn the conclusion reached by the U.S. as well as the international community at WRC-95 that the 455 and 459 MHz bands should be allocated to Little LEOs in Region 2. The Commission reiterates this finding in tentatively concluding in the *Notice* that domestic allocation of the WRC-95 spectrum "is needed to facilitate the competitive development of the Little LEO service." *Id.* at ¶ 9. Commenters who now oppose

⁴ See *Preparation for International Telecommunication Union World Radio Conferences*, Report, IC Docket No. 94-31, 78 Rad. Reg. 2d (P&F) 747 (1995) ("*WRC-95 Report*").

the proposed allocation have not shown that there has been any new development or change in circumstances since 1995 with respect to the bands at issue that would be a cause for interference concerns. Accordingly, Final Analysis urges the Commission to allocate the WRC-95 spectrum to Little LEOs as soon as possible.⁵

II. DISCUSSION

A. Current Spectrum Allocated to Little LEOs Will Only Partially Meet the Global Market Demand for Little LEO Services.

It is circular to argue -- as some commenters do⁶ -- that additional spectrum should not be allocated to Little LEOs because of a purported lack of market demand for Little LEO services. Little LEO markets are emerging, rather than mature markets, and are global in nature.⁷ Additional market demand will grow as Little LEOs acquire additional spectrum to fully implement all potential commercial services. Moreover, the potential Little LEO services range over numerous mobile data applications including automated meter reading ("AMR"), cargo and asset tracking, environmental and agricultural monitoring and control, automotive

⁵ While this proceeding concerns domestic allocation of spectrum allocated to Little LEOs at WRC-95, Final Analysis also urges the Commission to initiate proceedings as expeditiously as possible to allocate domestically the 1 MHz of spectrum allocated to Little LEOs at WRC-97.

⁶ Cf. Comments of UTC, The Telecommunications Association, filed in ET Docket No. 97-214 on December 1, 1997 at 3 ("UTC Comments"); Comments of the Land Mobile Communications Council ("LMCC").

⁷ See Final Analysis Communication Services, Inc., LITTLE LEO MARKET ANALYSIS, attached to Comments of Final Analysis, filed in IB Docket No. 96-220 on December 20, 1996 as Exhibit 1 (hereinafter, "FINAL ANALYSIS LITTLE LEO MARKET STUDY").

security, and personal messaging and e-mail,⁸ and the full complement of these services cannot be implemented on a competitive basis without additional spectrum.⁹

The Commission has acknowledged that it is in the public interest to promote new satellite technologies for the provision of communication services. In recognition of the demand for Little LEO services and the need to provide additional spectrum so that a fully competitive market is possible, Resolution 214 of WRC-95 concluded that an additional 7 to 10 MHz would be needed "in the near future." Moreover, the ITU-R Working Group 8D Market Study conducted pursuant to Resolution 214 confirms that an additional 21 MHz of spectrum on a shared, worldwide basis is needed for Little LEO services.¹⁰ The WRC-95 spectrum will provide much-needed additional uplink spectrum for Little LEOs, especially in view of the fact that the ratio of demand for uplink to downlink spectrum for commercial Little LEO operations will be approximately 2-to-1.¹¹

In contrast, commenters such as UTC who question the demand for Little LEO services have understated that demand by criticizing the estimated demand for utility-based AMR

⁸ See *id.* at 6 "Illustrative Little LEO Market Segments".

⁹ For instance, the current lack of spectrum sufficient to license enough competitive Little LEO operators to fully meet the demand for Little LEO services has been a central issue in resolution of the second Little LEO processing round. To facilitate conclusion of the second round, the Commission decided in establishing a three-system band plan in the *Second Round Report and Order* to grant the licensee in System 2 a first priority on additional future spectrum in recognition of the fact that, without the expectation of future additional spectrum, System 2 cannot be a fully competitive system in the spectrum assigned to it. *Id.* at ¶ 35.

¹⁰ See ITU-R Working Group 8-D Market Study at §§ 3.1-3.2, 4 (attached to Final Analysis Comments in IB Docket No. 96-220 as Attachment B).

¹¹ See *id.*

services.¹² Contrary to UTC's assessment, there is great demand for Little LEO-based AMR services among utility customers. Several market studies performed subsequent to WRC 95, which are independent market research studies not financed by the Little LEO industry, show higher projected demand for Little LEO services than was assumed in the WRC-95 deliberations. In addition, the fact that one of the first demonstration contracts that has been signed with Final Analysis is for utility applications further evidences the fact that the emerging demand for Little LEO-based utility communications such as AMR is real. Finally, it is well-established that AMR is only one of a potential range of mobile data and tracking services to be provided by Little LEOs in global markets.

The Land Mobile Communications Council ("LMCC") in claiming that its utility membership may not be interested in utilizing Little LEO services and that demand for Little LEO service is "dwindling"¹³ fails to recognize that the market for Little LEOs is both global and emerging and that LMCC members have not had an alternative to terrestrial telecommunication technologies. LMCC suggests that the projected demand for Little LEOs is not realistic given that, although private land mobile users who comprise LMCC's membership are potential customers of Little LEO-based services such as AMR, remote asset tracking, vehicle messaging, personal messaging and SCADA, these potential customers as members of LMCC "have been leading opponents to further shared allocations for NVNG MSS." See LMCC Comments at n.8. This argument is circular. Existing private land mobile user membership of LMCC, such as the American Petroleum Institute and the Utilities

¹² Cf. UTC Comments at 3.

¹³ Cf. Comments of LMCC at 3-5.

Telecommunications Council, arguably have been historically opposed to further allocations in the 459-460 MHz band because they have not had a non-terrestrial alternative way to meet their mobile data communications needs. However, the interest of private utilities and other private land mobile users in using NVNG MSS communications services is well-established.¹⁴

Accordingly, no commenter has rebutted the Commission's tentative finding in the *Notice* that allocation of the WRC-95 spectrum to Little LEOs is in the public interest. Allocation of WRC-95 spectrum to Little LEOs is in the public interest as it will help meet current and future demand for Little LEO services, particularly with respect to much-needed feeder and service uplink spectrum, as well as providing a new source of competition to existing land mobile telecommunication services.

B. Little LEO Operations the 455-456 MHz Band Do Not Pose a Threat of Interference to Remote Broadcast Operations.

Several commenters in the broadcast community voice concern that allocation of WRC-95 spectrum to Little LEOs poses a threat of interference to remote broadcast operations

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The Commission has stated that it expects Little LEOs to compete for terrestrial mobile customers and that Little LEO-based alternatives to terrestrial mobile communications will grow over time. *See Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services*, Second Report, FCC 97-75 at Appendix A pp. 3-5 (released on March 25, 1997). To the extent that some members of LMCC may be opposed to Little LEO allocation because it will compete with terrestrial mobile services, such opposition would be contrary to the Communications Act's provisions that the Commission shall promote the competitive provision of communications services and new technologies as a legitimate public policy goal, and the efficient allocation of spectrum as a scarce public resource. *See id.*; *see also* Conference Report to the Telecommunications Act of 1996, H.R. Rep. No. 458, 104th Cong., 2d. Sess. (establishing a "pro-competitive, deregulatory national policy framework designed to accelerate rapidly private sector deployment of advanced telecommunications and information technologies and services to all Americans by opening all telecommunications markets to competition").

in the 455-456 MHz band.¹⁵ However, as stated in Final Analysis's comments in this proceeding, sharing on a non-interference basis between Little LEOs and broadcast auxiliary operations in this band is feasible. *See* Final Analysis Comments at 6-7.

The broadcast commenters express concern that Little LEO uplink operations in the 455-456 MHz band could interfere with remote broadcast operations.¹⁶ However, as acknowledged in the *Notice* and the *WRC-95 Report*, remote broadcast operations are geographically limited and finite in number. The greatest remote broadcast usage, as the broadcast commenters admit, is restricted to major urban TV and radio markets.

In comparison, the *WRC-95 Report* recognizes that certain characteristics of Little LEO transmissions such as low power techniques and brief message duration limit the potential of interference to remote broadcast operations. *See WRC-95 Report* at ¶ 26. Moreover, to the extent that the 455-456 MHz band is used for Little LEO feeder uplink, the location and number of gateway earth stations will be geographically separate from remote broadcast operations.¹⁷ Finally, Little LEO operators will employ proprietary channel polling techniques, such as Dynamic Channel Activity Assignment System ("DCAAS") and Final Analysis's DCAAS-based

¹⁵ *See, e.g.,* Comments of Chancellor Media Corp. ("Chancellor"); Comments of ABC, Inc. ("ABC"); Comments of the Society of Broadcast Engineers, Inc. ("SBE"); Comments of National Association of Broadcasters ("NAB").

¹⁶ *See, e.g.,* Chancellor Comments at 4; SBE Comments at 6; Engineering Statement of Kenneth J. Brown, attached to ABC Comments (hereinafter "Brown Affidavit").

¹⁷ *See* Joint Supplemental Reply Comments filed by CTA Commercial Systems, Inc., E-SAT, Inc., Final Analysis Communication Services, Inc., GE American Communications, Inc., Leo One USA Corp., Orbital Communications Corp., Starsys Global Positioning, Inc., and Volunteers in Technical Assistance in IC Docket No. 94-31 on May 18, 1995 at Exhibit 2 p.7 ("WRC-95 Joint Supplemental Reply Comments").

Scanning Telemetry Activity Receive System ("STARS"), that will scan the 455-456 MHz band for an open uplink channel to avoid interfering with a channel in the 455-456 MHz band already occupied by a remote broadcast operation.¹⁸

Many of the broadcast auxiliary users' concerns regarding the feasibility of sharing with Little LEOs in the 455-456 MHz band stem from a misperception of how Little LEOs work. For example, some commenters suggest that broadcast auxiliary services heavily use the 455-456 MHz band on an intermittent basis, and that a Little LEO communication may interfere with a broadcast auxiliary communication, such as a live remote traffic or news report, by occupying a channel that is subsequently required for a broadcast intermittent use. *See* NAB Comments at 4. However, intermittent use means that all channels in the 455-456 MHz band in a particular geographic area are not in use at the same time continuously. Under the dynamic channel assignment techniques and low duty cycles used by Little LEOs, if a channel is in use, the satellite will note the power generation and not select the channel.

Some broadcasters overestimate the potential for interference based on misperceptions regarding how Little LEO dynamic channel assignment techniques work. For example, SBE suggests that Little LEO operations in the 455-456 MHz band will increase the likelihood of interference given that a Little LEO satellite's dynamic channel assignment techniques will incorrectly assign a particular channel in use by a remote broadcast as unused and "available" if the satellite polls the channel when the channel is "quiet" during the pauses that often occur in a particular remote broadcast. However, channel polling techniques such as DCAAS and STARS used by Little LEO satellites do not search for available channels by

¹⁸

See Final Analysis Comments at 7; ORBCOMM Comments at 7-8.

"listening" for audible broadcast transmissions. In fact, the satellite scans for a power signature and if a mobile radio transmitter is broadcasting on a channel and what it broadcasts for a second is silence, the transmitter will still generate a power signature and the satellite will therefore not select that channel.

Other broadcast interference concerns are based on an incorrect assessment of the required power generation needed for an NVNG MSS satellite to register channel use. For instance, the University of California suggests that a Little LEO satellite will not be able to detect a transmission of less than 15 watts¹⁹ and ABC claims that satellites will not be able to detect remote transmissions for special events typically transmitted at low powers of approximately 5 watts or less.²⁰ In fact, as noted on the record, Little LEO satellites are designed to detect transmissions of as low as 3.5 milliwatts in a 2.5 kHz channel (5.4 dBm/2.5 kHz) in daily use, although the technology is capable of detecting any transmission a few dB over the noise floor. All the broadcast auxiliary power levels reported in the comments, including low power voting repeater or relay transmissions, are orders of magnitude higher than the level at which DCAAS-type systems can detect power transmissions.

Horizontally polarized and highly directional antenna use cited in some comments also are detectable by the satellite. The University of California states that transmissions in its area are typically of 15 watts or less in 100 kHz channels, which is equivalent to 25.7 dBm/2.5 kHz. Since the satellite's sensitivity is lower than 3.5 mW in a 2.5 kHz bandwidth (5.4

¹⁹ See Letter from M. Stuart Lynn, Associate Vice President, Information Resources and Communications, University of California, to the Office of the Secretary, FCC, filed on December 2, 1997 in ET Docket No. 97-214 at 1 ("University of California Comments").

²⁰ See Brown Affidavit at 1.

dBm/2.5 kHz), the antenna's sidelobe suppression would have to be greater than 20 dB for it to be undetectable by the satellite. This level of sidelobe suppression is impractical and greater than that typically found in commercial antennas used in this band.

Other commenters express a concern that variations in the size of remote broadcast channels may hinder the ability of Little LEO satellites to detect channel use. *See* Brown Affidavit at 3. However, these variations in channel size are transparent to the satellite's scanning system. For example, in the case of Final Analysis's Little LEO satellites, the satellite will scan the entire 1 MHz of the 455-456 MHz band in question with a resolution of up to 300 hertz. Given that the entire 1 MHz of the band is scanned with a resolution much smaller than any channel used, the splitting of wideband channels to accommodate multiple users, and differences in the size of channels in use, will not pose a problem in determining which channels are in use.

There is not a significant time delay after the completion of a scan and the transmission by ground units. Some commenters state that unless the satellite were providing continuous feedback to the uplink transmitters about frequency availability,²¹ there would always be interference, with an example provided that if the satellite scans for open channels once a minute, then LEO interference could last for up to one minute. In fact, there is only a lag of, at most, a few seconds between scan and transmission and, as pointed out by the FCC, the transmission itself only lasts approximately half a second on any one channel.²²

²¹ *See* NAB Comments at 4.

²² Some commenters overestimate the level of use by Little LEOs in a particular geographic area. *See* University of California Comments at 1. For instance, the University of California estimates that 400,000 Little LEO transmitters could be
(continued...)

C. Little LEO Operations in the 459-460 MHz Band Will Not Interfere with Land Mobile, Air-to-Ground Radiotelephone or Petroleum Communication Mobile Services.

Commenters in the land mobile,²³ air-to-ground radiotelephone²⁴ and petroleum communication mobile services²⁵ are concerned that Little LEO operations in the 459-460 MHz band will pose a threat of interference to their terrestrial fixed and mobile operations in this band. These commenters fail to raise any new or cognizable interference issues. Accordingly, allocation of the entire 459-460 MHz band to Little LEOs will not increase the potential for interference to these terrestrial mobile operators.

LMCC, representing the land mobile communications industry in the 459-460 MHz band, alleges that further spectrum sharing studies are necessary before the Commission allocates the 459-460 MHz band to Little LEOs.²⁶ However, the IWG-2A Final Report's

²²(...continued)

located in the San Francisco Bay Area, and argues that such a market size would only allow for one half-second transmission per unit every 13 minutes, a number of transmission the commenter stated would unlikely to be sufficient for most users. However, by regulation, the duty cycle for individual Little LEO transmitters in most bands is 450-millisecond maximum transmissions only every 15 minutes on the same frequency. Given that this required duty cycle limits Little LEO transmissions to 15-minute increments on the same frequency, University of California's exaggerated assumptions that result in a 13-minute duty cycle for Little LEO transmissions are still well within the 15-minute duty cycle required for Little LEO transmissions.

²³ See, e.g., LMCC Comments.

²⁴ See, e.g., Mobile Telecommunications Technologies Corp. ("Mtel") Comments; Hunt Aviation, Inc. Comments; Elite Aviation Comments; CPH Comments; Medical Claims Services Comments; Great Dane Power Equipment, Inc. Comments, Marmon Aviation Comments; Trillium Photographics Comments; Manitoba Corp. Comments.

²⁵ See, e.g., American Petroleum Institute ("API") Comments.

²⁶ See LMCC Comments at 6-7.

finding that frequency sharing is feasible between Little LEOs and land mobile service stations in the 450-470 MHz band encompassed sharing in the 459-460 MHz band. *See Notice* at ¶ 15. Moreover, preliminary data from Final Analysis's experimental satellite program suggest that land mobile usage in the 459-460 MHz band is limited in comparison to the congestion in the 148 MHz band currently allocated for Little LEO uplinks, and that STARS/DCAAS interference avoidance techniques will suffice to allow shared spectrum operations in the 459-460 MHz band. *See Final Analysis Comments* at 9-10.

Sharing the 459-460 MHz band with air-to-ground radiotelephone service is easily accomplished. Use of this band is intermittent and satellite-based DCAAS-type techniques will enable the satellite to avoid assigning channels in use, thus causing harmful interference. In the statistically rare and unlikely event that a brief NVNG MSS transmission does occur during use of an active channel, the brevity of the single transmission incident -- less than half a second -- will not constitute harmful interference. Furthermore, recent satellite scanning of the band from space indicates that the 459-460 band is much less heavily used, and much cleaner, than the 148-149 band currently allocated for service uplink to NVNG MSS.²⁷ The cited "congestion" of the 459-460 MHz band is therefore misstated.

Mtel incorrectly argues, with respect to air-to-ground radiotelephony, that geographic separation between transmitters will be difficult to achieve because an aircraft will be flying over the locations of ground-based transmitters. MTel Comments at 6. In fact, it is the Little LEO satellite at altitudes of approximately 1,000 kilometers and traveling at over 28,000 kilometers per hour ("km/hr"), as compared to approximately 900 km/hr for general

²⁷ *See Comments of Final Analysis* filed in ET Docket No. 97-214 on December 1, 1997 at 10.

aviation aircraft, that will scan the band for usage. The fact that a transmission is from a mobile target will not prevent its use of a channel from being noted and the channel avoided, and geographic separation is irrelevant when the satellite's footprint is approximately 5,000 kilometers wide.

Finally, previous significant analyses and technical studies of sharing with land mobile users in the 148 MHz band is directly relevant to users of the 459-460 band. Commenters cite previous study of analog radios and attempt to suggest that sharing studies are invalid unless air-to-ground phones and paging receiver/transmitters are specifically and singly analyzed. In fact any radio transmission, be it digital or analog, in excess of a few milliwatts over the noise floor will be detected by DCAAS, permitting those in-use channels to be avoided. The LMCC claims that interference could result if a land mobile user begins a transmission while a channel is in use by a Little LEO user. This problem is one intrinsic to land mobile communications in this band now, but given that this band is far less congested than alternative bands, the statistical probability is very low that such an event would occur and cause harmful interference more than once every few months in a particular geographic area.

Notwithstanding API's concern stated in its comments that Little LEO communications will interfere with petroleum mobile communications and oil spill containment services in the 459-460 MHz band,²⁸ the *WRC-95 Report* already has concluded that there is no cognizable threat of such interference occurring. As the *WRC-95 Report* states:

We believe that the technical analyses presented by the [Little LEO] system proponents corroborate that channel assignment and low power techniques, in conjunction with brief message duration and geographical separation similar to those adopted by the

28

API Comments at 8-10.

Commission in § 2.106, Table of Allocations, for other frequency bands, can be used successfully to assure that oil spill containment operations are not adversely affected. These techniques will also, we believe, protect broadcast auxiliary uses.

Id. at ¶ 26. Commenters have not produced evidence to dispute this conclusion.

API claims that the oil spill containment channels are so sensitive and crucial that they not only should be excluded from an NVNG MSS allocation but they also should be further protected by a 25 kHz guard band. *See* API Comments at 10-12. This claim does not accurately capture the feasibility of sharing the oil spill channel with Little LEOs on an uninterrupted and interference-protected basis. As API concedes, the oil spill channel is now shared with other land mobile users on a secondary basis. These secondary terrestrial mobile users are required to cease operation and vacate an oil spill channel upon notification that it is needed in a particular geographic region in the event of an oil spill. Unlike secondary terrestrial mobile users, notification of Little LEOs will not even be required in the event that an oil spill channel is needed for oil spill communications because Little LEO dynamic channel assignment techniques automatically avoid oil spill subscriber transmissions on these channels. Accordingly, the operating characteristics of Little LEO communications, combined with channel assignment techniques such as Final Analysis's STARS system, will prevent interference to co-channel petroleum and oil spill containment operations in the 459-460 MHz band.²⁹

²⁹

Accord ORBCOMM Comments at 10.

III. CONCLUSION

Accordingly, for the foregoing reasons, Final Analysis urges the Commission to proceed to allocate the 455-456 MHz and 459-460 MHz bands to Little LEO service in the public interest, convenience and necessity.

Respectfully submitted,

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Dated: December 22, 1997

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I hereby certify that a true and correct copy of the foregoing "**REPLY COMMENTS**" of Final Analysis Communication Services, Inc. was sent by hand delivery this 22nd day of December, 1997, to each of the following:

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